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INFORMATION AS POSSIBLE

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Crossref for the Cray

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Section 1

INTRODUCTION

1.1 PURPOSE

CROSSREF is a tool to assist a user in obtaining information about the contents of a library which was generated with a BUILD statement on the CRAY Computer under the CRAY OPERATING SYSTEM (COS). It develops several alphabetized listings and tables which yield information about each member of a library. It also produces statistics about the library.

1.2 FEATURES

CROSSREF produces the following:

1. List of all modules contained within a library.
2. Summary table by modules containing module size, module ENTRY POINTS, referenced COMMONS and required EXTERNALS.
3. List of all ENTRY POINTS.
4. List of UNSATISFIED EXTERNALS.
5. Summary table of ENTRY POINTS and optionally EXTERNALS.
6. List of COMMONS.
7. Summary table of COMMONS.
8. Table of Statistics
9. Table of Contents
10. Optionally allows output to be formatted to 8 1/2 inch vertical printer paper or CRT display.

Section 2

INPUT AND OUTPUT

2.1 INPUT DATA STRUCTURE

The input data is the last record of a library file which was generated by COS when the library was generated with a BUILD statement in the CRAY's JCL. The user has no control over this last record but will ACCESS it as shown in the Usage section of this document. For more information regarding this record see CRAY document COS Table Description (Internal Reference Manual SM-0045 under the loader directory table "DFT").

2.2 OUTPUT FILE STRUCTURE

Printed lists and tables are the only forms of output from this program. It requires an output device which is capable of 132 print positions unless the option for a CRT is used.

Section 3

LIMITATIONS AND TIMING

3.1 LIMITATIONS OF TABLES

CROSSREF has the following limitations of its internal tables:

Maximum of 4096 modules per library.

Maximum of 4096 ENTRY POINTS and/or EXTERNALS per library.

Maximum of 4096 COMMONS per library.

Maximum of 1024 ENTRY POINTS and/or EXTERNALS per module.

Maximum of 1024 COMMONS per module.

3.2 TIMING CONSIDERATIONS

No absolute benchmarks for timing of CROSSREF have been established. However, using the CRAY default of eight seconds should under normal conditions, be more than adequate for most libraries.

Section 4

USAGE

4.1 OPTIONS

CROSSREF normally defaults to format its output on eleven (11) inch vertical paper of sixty one (61) lines and 132 characters wide. Also, it defaults to exclude CRAY systems EXTERNALs in its lists and summaries (i.e., modules with special characters in the name).

The above defaults can be overridden by setting sense switches. They are:

SWITCH 1 ON to include CRAY systems EXTERNALs.

SWITCH 2 ON to format the output for eight and one half (8 1/2) inch vertical paper of fifty one (51) lines and 132 characters wide.

SWITCH 3 ON to format the output to a CRT. (80 characters wide by 24 lines vertical).

4.2 EXAMPLES OF JOB CONTROL LANGUAGE

In the following examples:

eod - Cards use 7/8/9 in column one.

Mercury or Jupiter VAX use /EOF.

VAX's except Jupiter or Mercury use %%EOR.

eo1 - Cards use 6/7/8/9 in column one.

Mercury or Jupiter VAX use /EOF.

VAX's except Jupiter Mercury use %%EOF.

Example A:

To list information contained within a library and accepting CROSSREF's defaults.

```
JOB,JN=jobname,US=user,PW=password.  
ACCOUNT,AC=user account.  
ACCESS, DN=XREF, PDN=CROSSREF, ID=SOFTLIB.  
ACCESS, DN=LIBN, PDN=name of library, ID=user id.  
SKIPD, DN=LIBN.  
SKIPF, DN=LIBN, NF=-1.  
COPYF, I=LIBN, O=TAPE1.  
REWIND, DN=TAPE1.  
ASSIGN, DN=TAPE1, A=FT01.  
LDR, DN=XREF.  
eod  
eoi
```

Example B:

To list information contained within a library fromatted for 8 1/2 inch vertical output and with systems EXTERNALs.

```
JOB,JN=jobname,US=user,PW=password.  
ACCOUNT,AC=user account.  
ACCESS, DN=XREF, PDN=CROSSREF, ID=SOFTLIB.  
SWITCH, 1=ON.  
SWITCH, 2=ON.  
ACCESS, DN=LIBN, PDN=name of library, ID=user id.  
SKIPD, DN=LIBN.  
SKIPF, DN=LIBN, NF=-1.  
COPYF, I=LIBN, O=TAPE1.  
REWIND, DN=TAPE1.  
ASSIGN, DN=TAPE1, A=FT01.  
LDR, DN=XREF.  
eod  
eoi
```

Section 5

ERROR MESSAGES

All error messages appear in the CRAY systems logfile. When an error is encountered, the job aborts.

ERROR WRONG TYPE INPUT

Will be displayed when a library file was not ACCESSEd, positioned with SKIPF, SKIPD and COPYF. or ASSIGNED correctly. See the JCL section.

All other error messages are of the form:

XXX
TABLE OVERFLOW

Where XXX is the table which exceeded the limits stated in the Limitation section.

1 - A

SAMPLE PRINTOUT FOR 11 1/2" paper

Printout from CROSSREF when set up for eleven inch
printer stock and set up to include systems routines.

OF POOR QUALITY

DATE 05/02/85

TIME 07:36:43

LIBRARY CROSS REFERENCE SYSTEM LIBRARY CROSS REFERENCE SYSTEM LIBRARY CROSS REFERENCE SYSTEM LIBRARY CROSS REFERENCE SYSTEM

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DATE 05/02/85

TIME 07:36:43

GENERAL INFORMATION

SEE LAST PAGE FOR TABLE OF CONTENTS.
SEE DAYFILE FOR NAME OF LIBRARY SELECTED.
I.E. ATTACH, TAPE1, XXXXXX, ETC.
OR
SEE LOGFILE FOR NAME OF LIBRARY SELECTED.
I.E. ACCESS, DM=XXXXXX, PDM=ZZZZZZ, ETC.
ALL NUMERIC VALUES ARE RADIX TEN (10).
UNLABELED COMAKN IS DENOTED BY TWO SLASHES (//).
SYSTEMS EXTERNAL WITH SPECIAL CHARACTERS WILL BE EXCLUDED.
DEFAULT PRINTER STOCK SIZE IS 11 INCH.

• • • • •
• THE LIBRARY CROSS REFERENCE SYSTEM WAS DEVELOPED FOR THE
• NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA) AT
• AMES RESEARCH CENTER, MOFFETT FIELD, CALIFORNIA 94035.
• UNDER CONTRACT NUMBER: MAS2-9891.
•
• CRAY VERSION 1.0 RELEASE DATE: JUNE 1984
•
• • • • •

THE FOLLOWING MODULES ARE MEMBERS OF THE SELECTED LIBRARY

CFAA	PPFUN	EYEOH1	FUNCTION	FUNCTION	IMF	LF	RY	SUBRT	SUBRT2
SUBRT3	SUBRT4	SUBRT5	SUBRTA	SUBRTB	SUBRT.C	SUBRTD	SUBRTE	SUBRTF	SUBRTG
SUBRT1	SUBRTM	SUBRTN	SUBRTO	SUBRTP	SUBRTC	SUBRTH	SUBRTI	SUBRTJ	SUBRTK
SUBRT2								SUBRTL	SUBRTV

SUMMARY BY MODULES

MOD NAME	ATTRIBUTES
CFAA	78-LENGTH 1 ENTRY POINT SAME AS MODULE
DPTUN	78-LENGTH 1 ENTRY POINT SAME AS MODULE
EYEOH1	508-LENGTH 1 ENTRY POINT SAME AS MODULE
EYEOH2	208-LENGTH 1 COMMON IMPTCOM
FUNCTIONA	82-LENGTH 1 COMMON IMPTCOM
FUNCTIONB	98-LENGTH 1 ENTRY POINT SAME AS MODULE
FUNCTIONC	154-LENGTH 1 ENTRY POINT SAME AS MODULE
IMF	78-LENGTH 1 EXTERNAL FUNCTION
LF	78-LENGTH 1 ENTRY POINT SAME AS MODULE
RY	74-LENGTH 1 ENTRY POINT SAME AS MODULE
SUBRT	518-LENGTH 11 ENTRY POINTS ENTRY1 ENTRY2 ENTRY3 ENTRY4 ENTRY5 ENTRY6 ENTRY7 ENTRY8 ENTRY9 ENTRY10 ENTRY11 ENTRY12 ENTRY13 ENTRY14 ENTRY15 ENTRY16 ENTRY17 ENTRY18 ENTRY19 ENTRY20 ENTRY21 ENTRY22 ENTRY23 ENTRY24 ENTRY25 ENTRY26 ENTRY27 ENTRY28 ENTRY29 ENTRY30 ENTRY31 ENTRY32 ENTRY33 ENTRY34 ENTRY35 ENTRY36 ENTRY37 ENTRY38 ENTRY39 ENTRY40 ENTRY41 ENTRY42 ENTRY43 ENTRY44 ENTRY45 ENTRY46 ENTRY47 ENTRY48 ENTRY49 ENTRY50 ENTRY51 ENTRY52 ENTRY53 ENTRY54 ENTRY55 ENTRY56 ENTRY57 ENTRY58 ENTRY59 ENTRY60 ENTRY61 ENTRY62 ENTRY63 ENTRY64 ENTRY65 ENTRY66 ENTRY67 ENTRY68 ENTRY69 ENTRY70 ENTRY71 ENTRY72 ENTRY73 ENTRY74 ENTRY75 ENTRY76 ENTRY77 ENTRY78 ENTRY79 ENTRY80 ENTRY81 ENTRY82 ENTRY83 ENTRY84 ENTRY85 ENTRY86 ENTRY87 ENTRY88 ENTRY89 ENTRY90 ENTRY91 ENTRY92 ENTRY93 ENTRY94 ENTRY95 ENTRY96 ENTRY97 ENTRY98 ENTRY99 ENTRY100 ENTRY101 ENTRY102 ENTRY103 ENTRY104 ENTRY105 ENTRY106 ENTRY107 ENTRY108 ENTRY109 ENTRY110 ENTRY111 ENTRY112 ENTRY113 ENTRY114 ENTRY115 ENTRY116 ENTRY117 ENTRY118 ENTRY119 ENTRY120 ENTRY121 ENTRY122 ENTRY123 ENTRY124 ENTRY125 ENTRY126 ENTRY127 ENTRY128 ENTRY129 ENTRY130 ENTRY131 ENTRY132 ENTRY133 ENTRY134 ENTRY135 ENTRY136 ENTRY137 ENTRY138 ENTRY139 ENTRY140 ENTRY141 ENTRY142 ENTRY143 ENTRY144 ENTRY145 ENTRY146 ENTRY147 ENTRY148 ENTRY149 ENTRY150 ENTRY151 ENTRY152 ENTRY153 ENTRY154 ENTRY155 ENTRY156 ENTRY157 ENTRY158 ENTRY159 ENTRY160 ENTRY161 ENTRY162 ENTRY163 ENTRY164 ENTRY165 ENTRY166 ENTRY167 ENTRY168 ENTRY169 ENTRY170 ENTRY171 ENTRY172 ENTRY173 ENTRY174 ENTRY175 ENTRY176 ENTRY177 ENTRY178 ENTRY179 ENTRY180 ENTRY181 ENTRY182 ENTRY183 ENTRY184 ENTRY185 ENTRY186 ENTRY187 ENTRY188 ENTRY189 ENTRY190 ENTRY191 ENTRY192 ENTRY193 ENTRY194 ENTRY195 ENTRY196 ENTRY197 ENTRY198 ENTRY199 ENTRY200
SUBRTB	178-LENGTH 2 ENTRY POINTS FUNCTIONA FUNCTIONB FUNCTIONC
SUBRTI	108-LENGTH 1 EXTERNAL COMMON SUBRT1
	5 COMMONS COMMON1 COMMON2 COMMON3 COMMON4 COMMON5 COMMON6 COMMON7 COMMON8 COMMON9 COMMON10 COMMON11 COMMON12 COMMON13 COMMON14 COMMON15 COMMON16 COMMON17 COMMON18 COMMON19 COMMON20 COMMON21 COMMON22 COMMON23 COMMON24 COMMON25 COMMON26 COMMON27 COMMON28 COMMON29 COMMON30 COMMON31 COMMON32 COMMON33 COMMON34 COMMON35 COMMON36 COMMON37 COMMON38 COMMON39 COMMON40 COMMON41 COMMON42 COMMON43 COMMON44 COMMON45 COMMON46 COMMON47 COMMON48 COMMON49 COMMON50 COMMON51 COMMON52 COMMON53 COMMON54 COMMON55 COMMON56 COMMON57 COMMON58 COMMON59 COMMON60 COMMON61 COMMON62 COMMON63 COMMON64 COMMON65 COMMON66 COMMON67 COMMON68 COMMON69 COMMON70 COMMON71 COMMON72 COMMON73 COMMON74 COMMON75 COMMON76 COMMON77 COMMON78 COMMON79 COMMON80 COMMON81 COMMON82 COMMON83 COMMON84 COMMON85 COMMON86 COMMON87 COMMON88 COMMON89 COMMON90 COMMON91 COMMON92 COMMON93 COMMON94 COMMON95 COMMON96 COMMON97 COMMON98 COMMON99 COMMON100 COMMON101 COMMON102 COMMON103 COMMON104 COMMON105 COMMON106 COMMON107 COMMON108 COMMON109 COMMON110 COMMON111 COMMON112 COMMON113 COMMON114 COMMON115 COMMON116 COMMON117 COMMON118 COMMON119 COMMON120 COMMON121 COMMON122 COMMON123 COMMON124 COMMON125 COMMON126 COMMON127 COMMON128 COMMON129 COMMON130 COMMON131 COMMON132 COMMON133 COMMON134 COMMON135 COMMON136 COMMON137 COMMON138 COMMON139 COMMON140 COMMON141 COMMON142 COMMON143 COMMON144 COMMON145 COMMON146 COMMON147 COMMON148 COMMON149 COMMON150 COMMON151 COMMON152 COMMON153 COMMON154 COMMON155 COMMON156 COMMON157 COMMON158 COMMON159 COMMON160 COMMON161 COMMON162 COMMON163 COMMON164 COMMON165 COMMON166 COMMON167 COMMON168 COMMON169 COMMON170 COMMON171 COMMON172 COMMON173 COMMON174 COMMON175 COMMON176 COMMON177 COMMON178 COMMON179 COMMON180 COMMON181 COMMON182 COMMON183 COMMON184 COMMON185 COMMON186 COMMON187 COMMON188 COMMON189 COMMON190 COMMON191 COMMON192 COMMON193 COMMON194 COMMON195 COMMON196 COMMON197 COMMON198 COMMON199 COMMON200

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DATE 95/02/85

MID NAME SUMMARY F7 MODULES
ATTRIBUTES

SUBRT2 90-LENGTH 1 ENTRY POINT SAME AS MODULE

1 COMMON ACOMMON

1 INTERNAL SUBRT3

SUBRT3 90-LENGTH 1 ENTRY POINT SAME AS MODULE

1 COMMON ACOMMON

1 INTERNAL SUBRT4

SUBRT4 94-LENGTH 1 ENTRY POINT SAME AS MODULE

2 COMMONS ACOMMON COM1N4

1 INTERNAL SUBRT5

SUBRT5 152-LENGTH 1 ENTRY POINT SAME AS MODULE

2 COMMONS ACOMMON COM1N4

3 ENTRY POINTS: ENTRY ENTRYA

36 COMMONS: // ACOMMON

COM1N1 COM1N2 COM1N3 COM1N4

COM1N5 COM1N6 COM1N7 COM1N8

COM1N9 COM1N10 COM1N11 COM1N12

COM1N13 COM1N14 COM1N15 COM1N16

COM1N17 COM1N18 COM1N19 COM1N20

COM1N21 COM1N22 COM1N23 COM1N24

COM1N25 COM1N26 COM1N27 COM1N28

COM1N29 COM1N30 COM1N31 COM1N32

COM1N33 COM1N34 COM1N35 COM1N36

COM1N37 COM1N38 COM1N39 COM1N40

COM1N41 COM1N42 COM1N43 COM1N44

COM1N45 COM1N46 COM1N47 COM1N48

COM1N49 COM1N50 COM1N51 COM1N52

COM1N53 COM1N54 COM1N55 COM1N56

COM1N57 COM1N58 COM1N59 COM1N60

COM1N61 COM1N62 COM1N63 COM1N64

COM1N65 COM1N66 COM1N67 COM1N68

COM1N69 COM1N70 COM1N71 COM1N72

COM1N73 COM1N74 COM1N75 COM1N76

COM1N77 COM1N78 COM1N79 COM1N80

COM1N81 COM1N82 COM1N83 COM1N84

COM1N85 COM1N86 COM1N87 COM1N88

COM1N89 COM1N90 COM1N91 COM1N92

COM1N93 COM1N94 COM1N95 COM1N96

COM1N97 COM1N98 COM1N99 COM1N100

PAGE 2

SUBRTO CONTINUED FROM PAGE 2

SUBRTE	182=LENGTH	2 ENTRY POINTS	FUNCTIONAL ENTRY	FUNCTIONAL SUBRTE	SUBRTE	SUBRTE	SUBRTE	UNSA TO
		5 COMMONS	//	ACOMMON	COMMONA	COMMONB	COMMONC	
		2 EXTERNALS	SUBRTF	UNSA TO				
		2 ENTRY POINTS	ENTRYF	SUBRTF				
		3 COMMONS	//	ACOMMON	COMMONA			
		2 EXTERNALS	SUBRTG	UNSA TO				
		2 ENTRY POINTS	ENTRYG	SUBRTG				
		4 COMMONS	//	ACOMMON	COMMONA	COMMONB	COMMONC	
		2 EXTERNALS	SUBRTH	UNSA TO				
		2 ENTRY POINTS	ENTRYH	SUBRTH				
		4 COMMONS	//	ACOMMON	COMMONA	COMMONB	COMMONC	
		2 EXTERNALS	SUBRTI	UNSA TO				
		2 ENTRY POINTS	ENTRYI	SUBRTI				
		4 COMMONS	//	ACOMMON	COMMONA	COMMONB	COMMONC	
		2 EXTERNALS	SUBRTJ	UNSA TO				
		2 ENTRY POINTS	ENTRYJ	SUBRTJ				
		4 COMMONS	//	ACOMMON	COMMONA	COMMONB	COMMONC	
		2 EXTERNALS	SUBRTK	UNSA TO				
		2 ENTRY POINTS	ENTRYK	SUBRTK				
		3 COMMONS	ACOMMON	COMMONA	COMMONB	COMMONC	COMMOND	
		2 EXTERNALS	SUBRTL	UNSA TO				
		2 ENTRY POINTS	ENTRYL	SUBRTL				
		2 COMMONS	ACOMMON	COMMONA	COMMONB	COMMONC	COMMOND	
		1 EXTERNAL	SUBRTM					

MOD NAME SUMMARY BY MODULES
ATTRIBUTES

SUBRTM 126-LENGTH 2 ENTRY POINTS: ENTRY SUBRTM
COMMON

SUBRTM 126-LENGTH 2 ENTRY POINTS: ENTRY SUBRTM
COMMON

SUBRTO 174-LENGTH 2 ENTRY POINTS: ENTRY SUBRTO
COMMON

SUBRTP 188-LENGTH 2 ENTRY POINTS: ENTRY SUBRTP
COMMON

SUBRTO 122-LENGTH 2 ENTRY POINTS: ENTRY SUBRTO
COMMON

SUBRTR 188-LENGTH 2 ENTRY POINTS: ENTRY SUBRTR
COMMON

SUBRTO 122-LENGTH 2 ENTRY POINTS: ENTRY SUBRTO
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SUBRTR 188-LENGTH 2 ENTRY POINTS: ENTRY SUBRTR
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SUBRTO 122-LENGTH 2 ENTRY POINTS: ENTRY SUBRTO
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SUBRTR 188-LENGTH 2 ENTRY POINTS: ENTRY SUBRTR
COMMON

SUBRTO 122-LENGTH 2 ENTRY POINTS: ENTRY SUBRTO
COMMON

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PAGE 5 DATE 05/02/85 LIBRARY CROSS REFERENCE TIME 07 .43

MOD. NAME SUMMARY BY MODULES
ATTRIBUTES

SUBRTV	138-LENGTH	2	ENTRY POINTS:	ENTRYV	SUBRTV
		1	COMMON:	ACOMMON	
		2	EXTERNALS:	SUBRTV	SUBRTZ
SUBRTW	138-LENGTH	2	ENTRY POINTS:	ENTRW	SUBRTW
		1	COMMON:	ACOMMON	
		2	EXTERNALS:	SUBRTX	SUBRTZ
SUBRTX	138-LENGTH	2	ENTRY POINTS:	ENTRW	SUBRTX
		1	COMMON:	ACOMMON	
		2	EXTERNALS:	SUBRTV	SUBRTZ
SUBRTY	122-LENGTH	2	ENTRY POINTS:	ENTRY	SUBRTY
		1	COMMON:	ACOMMON	
		1	EXTERNAL:	SUBRTZ	
SUBRTZ	138-LENGTH	2	ENTRY POINTS:	ENTRYZ	SUBRTZ
		1	COMMON:	ACOMMON	
		2	EXTERNALS:	ENTRY1	SUBRT0

CFAA DPFUN ENTRY ENTRY0 ENTRY1 ENTRY2 ENTRY3 ENTRY4 ENTRY5 ENTRY6 ENTRY7 ENTRY8 ENTRY9
 ENTRYA ENTRYB ENTRYC ENTRYD ENTRYE ENTRYF ENTRYG ENTRYH ENTRYI ENTRYJ ENTRYK ENTRYL ENTRYM
 ENTRYN ENTRYO ENTRYP ENTRYQ ENTRYR ENTRYS ENTRYT ENTRYU ENTRYV ENTRYW ENTRYX ENTRYY ENTRYZ
 FUNCTMA FUNCTNB FUNCTNC FUNCTND FUNCTNE FUNCTNF FUNCTNG FUNCTNH FUNCTNI FUNCTNJ FUNCTNK
 FUNCTNL FUNCTNM FUNCTNO FUNCTNP FUNCTNQ FUNCTNR FUNCTNS FUNCTNT FUNCTNV FUNCTNW FUNCTNX
 FUNCTNY FUNCTNZ SUBRTA SUBRTB SUBRTC SUBRTD SUBRTE SUBRTF SUBRTG SUBRTH SUBRTI SUBRTJ SUBRTK
 SUBRTL SUBRTM SUBRTN SUBRTO

CFAA DPFUN ENTRY ENTRYA IMF LF RF SUBRT SUBRTA

UNSATA UNSATA UNSATC UNSATD UNSATE UNSATF UNSATG UNSATH UNSATI UNSATJ UNSATK UNSATL UNSATM UNSATN

ENT PT. SUMMARY BY ENTRY POINTS
 REFERRING MODULE(S)

- ENTRY1 (SUBRT) 2 MODULES: SUBRTA SUBRTZ
- ENTRY10 (SUBRT) 1 MODULE: SUBRTA
- ENTRY2 (SUBRT) 1 MODULE: SUBRTA
- ENTRY3 (SUBRT) 1 MODULE: SUBRTA
- ENTRY4 (SUBRT) 1 MODULE: SUBRTA
- ENTRY5 (SUBRT) 1 MODULE: SUBRTA
- ENTRY6 (SUBRT) 1 MODULE: SUBRTA
- ENTRY7 (SUBRT) 1 MODULE: SUBRTA
- ENTRY8 (SUBRT) 1 MODULE: SUBRTA
- ENTRY9 (SUBRT) 1 MODULE: SUBRTA
- ENTRYB (SUBRTB) 1 MODULE: SUBRTB
- ENTRYC (SUBRTC) 1 MODULE: SUBRTB
- ENTRYD (SUBRTD) 1 MODULE: SUBRTB
- ENTRYE (SUBRTE) 1 MODULE: SUBRTB
- ENTRYF (SUBRTF) 1 MODULE: SUBRTB
- ENTRYG (SUBRTG) 1 MODULE: SUBRTB

ENT PT	ENTRY (SUBRTN)	MODULE	SUBRTN
	ENTRYI (SUBRTI)	1 MODULE	SUBRTB
	ENTRYJ (SUBRTJ)	1 MODULE	SUBRTB
	ENTRYK (SUBRTK)	1 MODULE	SUBRTB
	ENTRYL (SUBRTL)	1 MODULE	SUBRTB
	ENTRYM (SUBRTM)	1 MODULE	SUBRTB
	ENTRYN (SUBRTN)	1 MODULE	SUBRTB
	ENTRYO (SUBRTO)	1 MODULE	SUBRTB
	ENTRYP (SUBRTP)	1 MODULE	SUBRTB
	ENTRYQ (SUBRTQ)	1 MODULE	SUBRTB
	ENTRYR (SUBRTR)	1 MODULE	SUBRTB
	ENTRYS (SUBRTS)	1 MODULE	SUBRTB
	ENTRYT (SUBRTT)	1 MODULE	SUBS. TR
	ENTRYU (SUBRTU)	1 MODULE	SUBRTB
	ENTRYV (SUBRTV)	1 MODULE	SUBRTB
	ENTRYW (SUBRTW)	1 MODULE	SUBRTB
	ENTRYX (SUBRTH)	1 MODULE	SUBRTB
	ENTRYY (SUBRTY)	1 MODULE	SUBRTB
	ENTRYZ (SUBRTZ)	1 MODULE	SUBRTB
	EYEOH1	1 MODULE	SUBRTA
	EYEOH2	1 MODULE	SUBRTA
	FUNCTIONA	4 MODULES	FUNCTION SUBRT SUBRTA SUBRTB SUBRTD
	FUNCTIONB	3 MODULES	SUBRT SUBRTA SUBRTD
	FUNCTIONC	1 MODULE	SUBRT
	SUBRTB	4 MODULES	SUBRTA SUBRTB SUBRTD SUBRTZ
	SUBRTI	3 MODULES	SUBRTA SUBRTB SUBRTD
	SUBRTJ	2 MODULES	SUBRTI SUBRTA
	PAGE		7

LIBRARY CROSS REFERENCE

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TIME 07:16.43

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• • • • • SUMMARY BY ENTRY POINTS • • • • •
 REFERENCING MODULE(S)

ENT PT

SUBRT3	2 MODULES	SUBRT2	SUBRTB
SUBRT4	4 MODULES	SUBRT3	SUBRTA SUBRTB SUBRTD
SUBRT5	2 MODULES	SUBRT4	SUBRTA
SUBRTB	1 MODULE	SUBRTA	SUBRTA
SUBRTC	1 MODULE	SUBRTB	SUBRTB
SUBRTD	2 MODULES	SUBRTB	SUBRTB SUBRTC
SUBRTE	1 MODULE	SUBRTD	SUBRTD
SUBRTF	1 MODULE	SUBRTE	SUBRTE
SUBRTG	1 MODULE	SUBRTF	SUBRTF
SUBRTH	1 MODULE	SUBRTG	SUBRTG
SUBRTI	1 MODULE	SUBRTH	SUBRTH
SUBRTJ	1 MODULE	SUBRTI	SUBRTI
SUBRTK	1 MODULE	SUBRTJ	SUBRTJ
SUBRTL	1 MODULE	SUBRTK	SUBRTK
SUBRTM	1 MODULE	SUBRTL	SUBRTL
SUBRTN	1 MODULE	SUBRTM	SUBRTM
SUBRTO	1 MODULE	SUBRTN	SUBRTN
SUBRTP	1 MODULE	SUBRTO	SUBRTO
SUBRTO	1 MODULE	SUBRTP	SUBRTP
SUBRTR	1 MODULE	SUBRTO	SUBRTO
SUBRTS	1 MODULE	SUBRTR	SUBRTR
SUBRTT	1 MODULE	SUBRTS	SUBRTS
SUBRTU	1 MODULE	SUBRTT	SUBRTT
SUBRTV	1 MODULE	SUBRTU	SUBRTU
SUBRTW	1 MODULE	SUBRTV	SUBRTV
SUBRTX	1 MODULE	SUBRTW	SUBRTW
SUBRTY	1 MODULE	SUBRTX	SUBRTX
SUBRTY	1 MODULE	SUBRTY	SUBRTY

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ORIGINAL MODULES
 OF POOR QUALITY

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ENT PT SUMMARY BY ENTRY POINTS
REFERENCING MODULE(S)

SUBRTZ	5 MODULES	SUBRTB	SIGRTV	SUBRTW	SUBRTX	SUBRTY
UNSA7A (UNSATISFIED)	2 MODULES	SUBRTA	SUBRTC			
UNSA7B (UNSATISFIED)	1 MODULE	SUBRTA				
UNSA7C (UNSATISFIED)	1 MODULE	SUBRTA				
UNSA7D (UNSATISFIED)	1 MODULE	SUBRTA				
UNSA7E (UNSATISFIED)	1 MODULE	SUBRTA				
UNSA7F (UNSATISFIED)	1 MODULE	SUBRTA				
UNSA7G (UNSATISFIED)	1 MODULE	SUBRTA				
UNSA7H (UNSATISFIED)	1 MODULE	SUBRTA				
UNSA7I (UNSATISFIED)	1 MODULE	SUBRTA				
UNSA7J (UNSATISFIED)	1 MODULE	SUBRTA				
UNSA7K (UNSATISFIED)	1 MODULE	SUBRTA				
UNSA7L (UNSATISFIED)	1 MODULE	SUBRTA				
UNSA7M (UNSATISFIED)	1 MODULE	SUBRTA				
UNSA7N (UNSATISFIED)	1 MODULE	SUBRTA				
UNSA7O (UNSATISFIED)	11 MODULES	SUBRTA SUBRTK	SUBRTB SUBRTC SUBRTD SUBRTE SUBRTF SUBRTG SUBRTH SUBRTI SUBRTJ			

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COMMONS APPEARING IN THIS LIBRARY

COMMON1 COMMON2 COMMON3 COMMON4 COMMON5 COMMON6 COMMON7 COMMON8 COMMON9 COMMON10 COMMON11 COMMON12 COMMON13 COMMON14 COMMON15 COMMON16 COMMON17 COMMON18 COMMON19 COMMON20 COMMON21 COMMON22 COMMON23 COMMON24 COMMON25 COMMON26 COMMON27 COMMON28 COMMON29 COMMON30 COMMON31 COMMON32 COMMON33 COMMON34 COMMON35 COMMON36 COMMON37 COMMON38 COMMON39 COMMON40 COMMON41 COMMON42 COMMON43 COMMON44 COMMON45 COMMON46 COMMON47 COMMON48 COMMON49 COMMON50 COMMON51 COMMON52 COMMON53 COMMON54 COMMON55 COMMON56 COMMON57 COMMON58 COMMON59 COMMON60 COMMON61 COMMON62 COMMON63 COMMON64 COMMON65 COMMON66 COMMON67 COMMON68 COMMON69 COMMON70 COMMON71 COMMON72 COMMON73 COMMON74 COMMON75 COMMON76 COMMON77 COMMON78 COMMON79 COMMON80 COMMON81 COMMON82 COMMON83 COMMON84 COMMON85 COMMON86 COMMON87 COMMON88 COMMON89 COMMON90 COMMON91 COMMON92 COMMON93 COMMON94 COMMON95 COMMON96 COMMON97 COMMON98 COMMON99 COMMON100

SUMMARY BY COMMONS

COMMON NAME	COMMON(S) USING THE COMMON
COMMON	10 MODULES: SUBRTA SUBRTB SUBRTC SUBRTD SUBRTE SUBRTF SUBRTG SUBRTH SUBRTI SUBRTJ
COMMON1	33 MODULES: SUBRT0 SUBRT1 SUBRT2 SUBRT3 SUBRT4 SUBRT5 SUBRT6 SUBRT7 SUBRT8 SUBRT9 SUBRTA SUBRTB SUBRTC SUBRTD SUBRTE SUBRTF SUBRTG SUBRTH SUBRTI SUBRTJ SUBRTL SUBRTM
COMMON2	1 MODULE: SUBRTA
COMMON3	1 MODULE: SUBRTI
COMMON4	1 MODULE: SUBRTI
COMMON5	1 MODULE: SUBRTI
COMMON6	12 MODULES: SUBRT1 SUBRT2 SUBRT3 SUBRT4 SUBRT5 SUBRT6 SUBRT7 SUBRT8 SUBRT9 SUBRTA SUBRTB SUBRTC SUBRTD SUBRTE SUBRTF SUBRTG SUBRTH SUBRTI SUBRTJ SUBRTL SUBRTM
COMMON7	11 MODULES: SUBRTA SUBRTB SUBRTC SUBRTD SUBRTE SUBRTF SUBRTG SUBRTH SUBRTI SUBRTJ SUBRTL SUBRTM
COMMON8	5 MODULES: SUBRTA SUBRTB SUBRTC SUBRTD SUBRTE
COMMON9	3 MODULES: SUBRTA SUBRTB SUBRTC
COMMON10	3 MODULES: SUBRTA SUBRTB SUBRTC
COMMON11	2 MODULES: SUBRTA SUBRTB
COMMON12	1 MODULE: SUBRTA
COMMON13	1 MODULE: SUBRTA
COMMON14	1 MODULE: SUBRTA
COMMON15	1 MODULE: SUBRTA
COMMON16	1 MODULE: SUBRTA
COMMON17	1 MODULE: SUBRTA
COMMON18	1 MODULE: SUBRTA
COMMON19	1 MODULE: SUBRTA
COMMON20	1 MODULE: SUBRTA
COMMON21	1 MODULE: SUBRTA
COMMON22	1 MODULE: SUBRTA
COMMON23	1 MODULE: SUBRTA
COMMON24	1 MODULE: SUBRTA
COMMON25	1 MODULE: SUBRTA
COMMON26	1 MODULE: SUBRTA
COMMON27	1 MODULE: SUBRTA
COMMON28	1 MODULE: SUBRTA
COMMON29	1 MODULE: SUBRTA
COMMON30	1 MODULE: SUBRTA
COMMON31	1 MODULE: SUBRTA
COMMON32	1 MODULE: SUBRTA
COMMON33	1 MODULE: SUBRTA
COMMON34	1 MODULE: SUBRTA
COMMON35	1 MODULE: SUBRTA
COMMON36	1 MODULE: SUBRTA
COMMON37	1 MODULE: SUBRTA
COMMON38	1 MODULE: SUBRTA
COMMON39	1 MODULE: SUBRTA
COMMON40	1 MODULE: SUBRTA
COMMON41	1 MODULE: SUBRTA
COMMON42	1 MODULE: SUBRTA
COMMON43	1 MODULE: SUBRTA
COMMON44	1 MODULE: SUBRTA
COMMON45	1 MODULE: SUBRTA
COMMON46	1 MODULE: SUBRTA
COMMON47	1 MODULE: SUBRTA
COMMON48	1 MODULE: SUBRTA
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COMMON61	1 MODULE: SUBRTA
COMMON62	1 MODULE: SUBRTA
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COMMON64	1 MODULE: SUBRTA
COMMON65	1 MODULE: SUBRTA
COMMON66	1 MODULE: SUBRTA
COMMON67	1 MODULE: SUBRTA
COMMON68	1 MODULE: SUBRTA
COMMON69	1 MODULE: SUBRTA
COMMON70	1 MODULE: SUBRTA
COMMON71	1 MODULE: SUBRTA
COMMON72	1 MODULE: SUBRTA
COMMON73	1 MODULE: SUBRTA
COMMON74	1 MODULE: SUBRTA
COMMON75	1 MODULE: SUBRTA
COMMON76	1 MODULE: SUBRTA
COMMON77	1 MODULE: SUBRTA
COMMON78	1 MODULE: SUBRTA
COMMON79	1 MODULE: SUBRTA
COMMON80	1 MODULE: SUBRTA
COMMON81	1 MODULE: SUBRTA
COMMON82	1 MODULE: SUBRTA
COMMON83	1 MODULE: SUBRTA
COMMON84	1 MODULE: SUBRTA
COMMON85	1 MODULE: SUBRTA
COMMON86	1 MODULE: SUBRTA
COMMON87	1 MODULE: SUBRTA
COMMON88	1 MODULE: SUBRTA
COMMON89	1 MODULE: SUBRTA
COMMON90	1 MODULE: SUBRTA
COMMON91	1 MODULE: SUBRTA
COMMON92	1 MODULE: SUBRTA
COMMON93	1 MODULE: SUBRTA
COMMON94	1 MODULE: SUBRTA
COMMON95	1 MODULE: SUBRTA
COMMON96	1 MODULE: SUBRTA
COMMON97	1 MODULE: SUBRTA
COMMON98	1 MODULE: SUBRTA
COMMON99	1 MODULE: SUBRTA
COMMON100	1 MODULE: SUBRTA

ORIGINAL DOCUMENT
OF POOR QUALITY

PAGE 11 LIBRARY CROSS REFERENCE TIME 07 38 43

DATE 05/07/85

• • • • • SUMMARY BY COM 3-MS • • • • •
MODULE(S) USING THE COMMON

COM100	1 MODULE	SUBRTA
COM10P	1 MODULE	SUBRTA
COM10Q	1 MODULE	SUBRTA
COM10R	1 MODULE	SUBRTA
COM10S	5 MODULES	SUBRTA SUBRTB SUBRTC SUBRTD SUBRTE
COM10T	1 MODULE	SUBRTA
COM10U	1 MODULE	SUBRTA
COM10V	1 MODULE	SUBRTA
COM10W	1 MODULE	SUBRTA
COM10X	1 MODULE	SUBRTA
COM10Y	1 MODULE	SUBRTA
COM10Z	1 MODULE	SUBRTA
WR11COMA	2 MODULES	EYEDM1 EYEDM2 SUBRTA SUBRTD

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PAGE 12 DATE 05/02/85 LIBRARY CROSS REFERENCE TIME 07.36.43

. STATISTICS

MODULE 43
ENTRY POINTS 01
COMMONS 34
UNSAT EXTERNALS 15

RELOCATABLE DIRECTORY LENGTH 59^

WORDS REQUIRED TO LOAD ALL
RELOCATABLE MODULES IN THE 17400 OCTAL
SELECTED LIBRARY 7972 DECIMAL

TABLE OF CONTENTS

PAGE	SUBJECT
1	MODULES IN SELECTED LIBRARY
1	SUMMARY BY MODULES
6	ENTRY POINTS IN THE SELECTED LIBRARY
6	ENTRY POINTS NOT REFERENCED BY THIS LIBRARY
6	UNSATISFIED EXTERNALS
6	SUMMARY BY ENTRY POINTS
10	COMPIERS USED BY SELECTED LIBRARY
10	SUMMARY BY COMPIERS
12	STATISTICS

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DATE 05/02/81

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ELAPSED TIME 0 12 48 SECONDS

APPENDIX B

SAMPLE PRINTOUT FORMATTED FOR CRT DISPLAY CROSSREF

Setup to format for a CRT and set up to include systems routines.

* * * * *
*
* THE LIBRARY CROSS REFERENCE SYSTEM WAS DEVELOPED FOR THE *
* NATIONAL AFRONAUTICS AND SPACE ADMINISTRATION (NASA) AT *
* AMES RESEARCH CENTER, MOFFETT FIELD, CALIFORNIA 94035. *
* UNDER CONTRACT NUMBER: NAS2-2891. *
*
* CRAY VERSION 1.0 RELEASE DATE: JUNE 1984 *
*
* * * * *

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LIBRARY CROSS REFERENCE

DATE 05/02/35

TIME 07:54:16

* * THE FOLLOWING MODULES ARE MEMBERS OF THE SELECTED LIBRARY* *

CFAA	DPFUN	EYEOH1	EYEOH2	FUNCTNA	FUNCTNB	FUNCTNC	INF
LF	RF	SUBRT	SUBRTO	SUBRT1	SUBRT2	SUBRT3	SUBRT4
SUBRT5	SUBRTA	SUBRTE	SUBRTC	SUBRTD	SUBRTE	SUBRTF	SUBRTG
SUBRTH	SUBRTI	SUBRTJ	SUBRTK	SUBRTL	SUBRTM	SUBRTN	SUBRTO
SUBRTP	SUBRTQ	SUBRTR	SUBRTS	SUBRTT	SUBRTU	SUBRTV	SUBRTW
SUBRTX	SUBRTY	SUBRTZ					

MOD. NAME * * * * * SUMMARY BY MODULES * * * * *

ATTRIBUTES

CFAA	76-LENGTH	1	ENTRY POINT:	SAME AS MODULE
DPFUN	76-LENGTH	1	ENTRY POINT:	SAME AS MODULE
EYEOH1	500-LENGTH	1	ENTRY POINT:	SAME AS MODULE

1 COMMON: WRITCOMA

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MOD. NAME SUMMARY BY MODULES
 ATTRIBUTES

EYEOH1 CONTINUED FROM PAGE 1
 13 EXTERNALS: \$EOFW \$SRB \$REWF
 \$RFF \$RFI \$RFV%
 \$RUF \$RUI \$RUV%
 \$WB \$WFF \$WFI
 \$WFV%

EYEOH2 208-LENGTH 1 ENTRY POINT: SAME AS MODULE
 1 COMMON WRITCOMA

3 EXTERNALS: \$CLS \$OPN \$WB
 82-LENGTH 1 ENTRY POINT: SAME AS MODULE

FUNCTNA
 PAGE 2

MOD. NAME * * * * * SUMMARY BY MODULES * * * * *
 ATTRIBUTES

FUNCTNB	96-LENGTH	1 ENTRY POINT	SAME AS MODULE	EXP%	FUNCTNA	SIN%
		1 EXTERNAL:	SQRT%			
FUNCTNC	154-LENGTH	1 ENTRY POINT:	SAME AS MODULE			
		4 EXTERNALS:	SQRT%			
INF	76-LENGTH	1 ENTRY POINT:	SAME AS MODULE			
LF	76-LENGTH	1 ENTRY POINT:	SAME AS MODULE			
RF	76-LENGTH	1 ENTRY POINT:	SAME AS MODULE			

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MOD. NAME * * * * * SUMMARY BY MODULES * * * * *
ATTRIBUTES

SUBRT 518=LENGTH 11 ENTRY POINTS: ENTRY1 ENTRY10 ENTRY2 ENTRY5
ENTRY3 ENTRY4 ENTRY5
ENTRY6 ENTRY7 ENTRY6
ENTRY8 SUBRT

1 COMMON: ACOMMON

3 EXTERNALS: FUNCTNA FUNCTNB FUNCTNC

SUBRTO 170=LENGTH 2 ENTRY POINTS: ENTRYO SUBRTO

1 COMMON: ACOMMON

3 EXTERNALS: \$WFF \$WFI SUBRT1

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MOD. NAME SUMMARY BY MODULES
ATTRIBUTES

SUBRT1	106-LENGTH	1	ENTRY POINT:	SAME AS MODULE		
		5	COMMONS:	ACOMMON	COMMON1	COMMON2
				COMMON3	COMMON4	
		1	EXTERNAL:	SUBRT2		
SUBRT2	90-LENGTH	1	ENTRY POINT:	SAME AS MODULE		
		1	COMMON:	ACOMMON		
		1	EXTERNAL:	SUBRT3		
SUBRT3	90-LENGTH	1	ENTRY POINT:	SAME AS MODULE		
		1	COMMON:	ACOMMON		

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MOD. NAME * * * * * SUMMARY BY MODULES * * * * *
ATTRIBUTES

SUBRT3 CONTINUED FROM PAGE 5

1 EXTERNAL: SUBRT4

SUBRT4 94-LENGTH 1 ENTRY POINT: SAME AS MODULE

2 COMMONS: ACOMMON COMMON4

1 EXTERNAL: SUBRT5

SUBRT5 152-LENGTH 1 ENTRY POINT: SAME AS MODULE

2 COMMONS: ACOMMON COMMON4

3 EXTERNALS: \$RFF \$RFI \$RFV%

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SUMMARY BY MODULES
ATTRIBUTES

MOD. NAME

SUBRTA	862-LENGTH	3 ENTRY POINTS:	ENTRY	ENTRYA	SUBRTA
		30 COMMONS:	//	ACOMMON	COMMON
			COMMONA	COMMONB	COMMONC
			COMMOND	COMMONE	COMMONF
			COMMONG	COMMONH	COMMONI
			COMMONJ	COMMONK	COMMONL
			COMMONM	COMMONN	COMMONO
			COMMONP	COMMONQ	COMMONR
			COMMONS	COMMONT	COMMONU
			COMMONV	COMMONW	COMMONX
			COMMONY	COMMONZ	WRITCOMA

42 EXTERNALS:

\$RFF	\$RFV%
COS%	ENTRY1
ENTRY2	ENTRY3
	ENTRY4
	ENTRY10

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MOD. NAME SUMMARY BY MODULES ATTRIBUTES

SUBRTA CONTINUED FROM PAGE 7

ENTRY7	ENTRY6	ENTRY5	ENTRY7
ENTRY8	ENTRY9	ENTRY8	ENTRY8
EYEOH1	EYEOH2	EYEOH1	FUNC1NA
FUNCTIONB	SIN%	FUNCTIONB	SUBRTO
SUBRT1	SUBRT2	SUBRT1	SUBRT4
SUBRT5	SUBRTB	SUBRT5	TAN%
UNSATA	UNSATB	UNSATA	UNSATC
UNSATD	UNSATF	UNSATD	UNSATF
UNSATG	UNSATH	UNSATG	UNSATI
UNSATJ	UNSATK	UNSATJ	UNSATL
UNSATM	UNSATN	UNSATM	UNSATO

SUBRTB	580=LENGTH	2	ENTRY POINTS:	ENTRYB	SUBRTB
		8	COMMONS:	//	ACOMMON
					COMMONA

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MOD. NAME SUMMARY BY MODULES ATTRIBUTES

SUBRTB CONTINUED FROM PAGE 8

COMMONB COMMONC	COMMONC COMMONC	COMMONC COMMONC	COMMONC COMMONC
\$RFF	\$RFI	\$RFV%	
COS%	ENTRYC	ENTRYD	
ENTRYE	ENTRYF	ENTRYG	
ENTRYH	ENTRYI	ENTRYJ	
ENTRYK	ENTRYL	ENTPYM	
ENTRYN	ENTRYO	ENTRYP	
ENTRYQ	ENTRYR	ENTRYS	
ENTRYT	ENTRYU	ENTRYV	
ENTRYW	ENTRYX	ENTRYY	
ENTRYZ	SIN%	SUBRTO	
SUBRTI	SUBRT3	SUBRT4	
SUBRTC	SUBRTD	SUBRTZ	

37 EXTERNALS:

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MOD. NAME SUMMARY BY MODULES
ATTRIBUTES

SUBRTB CONTINUED FROM PAGE 9

UNSATO

SUBRTC 192-LENGTH 2 ENTRY POINTS: ENTRYC SUBRTC

7 COMMONS: //
COMMONB COMMONC
COMMONS

5 EXTERNALS: COS% SUBRTD
UNSATO

SUBRTD 388-LENGTH 2 ENTRY POINTS: ENTRYD SUBRTD

6 COMMONS: //
COMMONB COMMONC
COMMONC WRITCOMA

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MOD. NAME SUMMARY BY MODULES
 ATTRIBUTES

SUBRTD CONTINUED FROM PAGE 10

	13 EXTERNALS:	\$RFF	\$RFI	\$RPV%
		\$WFF	\$WFI	COS%
		FUNCTNA	FUNCTNB	SIN%
		SUBRTO	SUBRT4	SUBRTE
		UNSATO		

SUBRTE	182-LENGTH	2 ENTRY POINTS:	ENTRYE	SUBRTE
		5 COMMONS:	//	ACOMMON
			COMMONB	COMMONS
		4 EXTERNALS:	COS%	COMMONA
			UNSATO	COMMONS
			SIN%	SUBRTF
			UNSATO	

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MOD. NAME SUMMARY BY MODULES
ATTRIBUTES

SUBRTF	240-LENGTH	2	ENTRY POINTS:	ENTRYF	SUBRTF	COMMON	COMMONA
		3	COMMONS:	//	ACOMMON		
		7	EXTERNALS:	\$RFF	\$RPI	\$RFV%	
				COS%	SIN%	SUBRTG	
				UNSATD			

SUBRTG	142-LENGTH	2	ENTRY POINTS:	ENTRYG	SUBRTG	ACOMMON	COMMON4
		4	COMMONS:	//	ACOMMON		
				COMMONA			
		2	EXTERNALS:	SUBRTH	UNSATD		

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SUMMARY BY MODULES

MOD. NAME ATTRIBUTES

SUBRTH	142-LENGTH	2	ENTRY POINTS:	ENTRYH	SUBRTH	ACOMMON	COMMON4
		4	COMMONS:	//	COMMONA		
		2	EXTERNALS:	SUEA21	UNSAT0		
SUBRTI	192-LENGTH	2	ENTRY POINTS:	ENTRYI	SUBRTI	ACOMMON	COMMON4
		4	COMMONS:	//	COMMONA		
		4	EXTERNALS:	\$WFF	\$WFI		SUBRTJ
				UNSAT0			

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MOD. NAME * * * * * SUMMARY BY MODULES * * * * *

142-LENGTH 2 ENTRY POINTS: ENTRYJ SUBRTJ ACOMMON COMMON4

4 COMMONS: // COMMONA

2 EXTERNALS: SUBRTK UNSATO

138-LENGTH 2 ENTRY POINTS: ENTRYK SUBRTK

3 COMMONS: ACOMMON COMMON4 COMMONA

2 EXTERNALS: SUBRTL UNSATO

192-LENGTH 2 ENTRY POINTS: ENTRYL SUBRTL

2 COMMONS: ACOMMON COMMON4

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MOD NAME * * * * * SUMMARY BY MODULES * * * * *
ATTRIBUTES

SUBRTL CONTINUED FROM PAGE 14

			\$RFF	\$RFI	\$RFV%
4	SUBRTM	126-LENGTH	SUBRTM	SUBRTM	
			4 EXTERNALS:		
			2 ENTRY POINTS:		
			2 COMMONS:	COMMON4	
			1 EXTERNAL:		
			2 ENTRY POINTS:		
			2 COMMONS:	COMMON4	
			1 EXTERNAL:		

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* * * * * SUMMARY BY MODULES * * * * *
ATTRIBUTES

SUBRTO	174-LENGTH	2	ENTRY POINTS:	ENTFYO	SUBRTO
		2	COMMONS:	ACOMMON	COMMON4
		3	EXTERNALS:	\$WFF	\$WFI
SUBRTP	188-LENGTH	2	ENTRY POINTS:	ENTRYP	SUBRTP
		1	COMMON:	ACOMMON	
		1	EXTERNALS:	\$RFF	\$RFI
				SUBRTQ	\$LFFV%
SUBRTQ	122-LENGTH	1	ENTRY POINTS:	ENTRYQ	SUBRTQ
		1	COMMON:	ACOMMON	

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MOD. NAME SUMMARY BY MODULES
ATTRIBUTES

SUBRTQ CONTINUED FROM PAGE 16

1	EXTERNAL:	SUBRTR		
2	ENTRY POINTS:	ENTRYR	SUBRTR	
1	COMMON:	ACOMMON		
4	EXTERNALS:	\$RFF	\$RFI	\$RFV%
		SUBRTS		
2	ENTRY POINTS:	ENTRYS	SUBRTS	
1	COMMON:	ACOMMON		
1	EXTERNAL:	SUBRTT		

* * * * * SUMMARY BY MODULES * * * * *
 ATTRIBUTES

MOD. NAME	122-LENGTH	2 ENTRY POINTS:	ENTRYT	SUBRTT
SUBRTT		1 COMMON:	ACOMMON	
		1 EXTERNAL:	SUBRTU	
SUBRTU	122-LENGTH	2 ENTRY POINTS:	ENTRYU	SUBRTU
		1 COMMON:	ACOMMON	
		1 EXTERNAL:	SUBRTV	
SUBRTV	138-LENGTH	2 ENTRY POINTS:	ENTRYV	SUBRTV
		1 COMMON:	ACOMMON	
		2 EXTERNALS:	SUBRTW	SUBRTZ

MOD. NAME SUMMARY BY MODULES
ATTRIBUTES

SUBRTW 130-LENGTH 2 ENTRY POINTS: ENTRYW SUBRTW

1 COMMON: ACOMMON

2 EXTERNALS: SUBRTX SUBRTZ

SUBRTX 130-LENGTH 2 ENTRY POINTS: ENTRYX SUBRTX

1 COMMON: ACOMMON

2 EXTERNALS: SUBRTY SUBRTZ

SUBRTY 122-LENGTH 2 ENTRY POINTS: ENTRYY SUBRTY

1 COMMON: ACOMMON

1 EXTERNAL: SUBRTZ

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MOD. NAME	130-LENGTH	2 ENTRY POINTS:	ENTRYZ	SUBRTZ
		1 COMMON:	ACOMMON	
		2 EXTERNALS:	ENTR'1	SUBRTO

SUBRTZ

SUBRTZ

1 COMMON:

ACOMMON

2 EXTERNALS:

ENTR'1

SUBRTO

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• THE FOLLOWING ENTRY POINTS ARE MEMBERS OF THE SELECTED LIBRARY •

CFAA	DPFUN	ENTRY	ENTRY0	ENTRY1	ENTRY10	ENTRY2	ENTRY3
ENTRY4	ENTRY5	ENTRY6	ENTRY7	ENTRY8	ENTRY9	ENTRYA	ENTRYB
ENTRYC	ENTRYD	ENTRYE	FJTRYF	ENTRYG	ENTRYH	ENTRYI	ENTRYJ
ENTRYK	ENTRYL	ENTRYM	ENTRYN	ENTRYO	ENTRYP	ENTRYQ	ENTRYP
ENTRYS	ENTRYS	ENTRYU	ENTRYS	ENTRYW	ENTRYS	ENTRYS	ENTRYS
EYEOH1	EYEOH2	FUNCTNA	FUNCTNB	FUNCTNC	INF	LF	RF
SUBRT	SUBRTO	SUBRT1	SUBRT2	SUBRT3	SUBRT4	SUBRT5	SUBRTA
SUBRTB	SUBRTC	SUBRTD	SUBRTE	SUBRTF	SUBRTG	SUBRTH	SUBRTI
SUBRTJ	SUBRTK	SUBRTL	SUBRTM	SUBRTN	SUBRTO	SUBRTP	SUBRTQ
SUBRTR	SUBRTS	SUBRTT	SUBRTU	SUBRTV	SUBRTW	SUBRTX	SUBRTY
SUBRTZ							

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* * THE FOLLOWING ENTRY POINTS ARE NOT REFERENCED BY THIS LIBRARY* *

CFAA	DPFUN	ENTRY	ENTRYO	ENTRYA	INF	LF	RF
SUBRT	SUBRTA						

* * UNSATISFIED EXTERNALS REQUIRED BY MEMBERS OF THIS LIBRARY* *

UNSATI	UNSATJ	UNSATK	UNSATL	UNSATM	UNSATN	UNSATO	UNSATP	UNSATQ	UNSATR	UNSATU	UNSATV	UNSATW	UNSATX	UNSATY	UNSATZ

* * SUMMARY BY ENTRY POINTS AND EXTERNALS* *

ENT. PT. & EXTERNALS	REFERENCING MODULE(S)
----------------------	-----------------------

\$CLS (CRAY LIBRARY) 1 MODULE: EYEOH2

\$EOFW (CRAY LIBRARY) 1 MODULE: EYEOH1

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* * SUMMARY BY ENTRY POINTS AND EXTERNALS * *
ENT. PT. & EXTERNALS REFERENCING MODULE(S)

\$OPN	(CRAY LIBRARY)	1	MODULE: EYEOH2				
\$RB	(CRAY LIBRARY)	1	MODULE: EYEOH1				
\$REWF	(CRAY LIBRARY)	1	MODULE: EYEOH1				
\$RFF	(CRAY LIBRARY)	9	MODULES: EYEOH1 SUBRTD SUBRTR	SUBRT5 SUBRTF	SUBRTA SUBRTL	SUBRTB SUBRTP	
\$RFI	(CRAY LIBRARY)	9	MODULES: EYEOH1 SUBRTD SUBRTR	SUBRT5 SUBRTF	SUBRTA S'JERTL	SUBRTB SUBRTP	
\$RFV%	(CRAY LIBRARY)	9	MODULES: EYEOH1 SUBRTD	SUBRT5 SUBRTF	SUBRTA SUBRTL	SUBRTB SUBRTP	

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' SUMMARY BY ENTRY POINTS AND EXTERNALS' .
ENT. PT & EXTERNALS REFERENCING MODULE(S)

\$RFV* CONTINUED FROM PAGE 23

				SUBPTR
\$RUF	(CRAY LIBRARY)	1 MODULE:	EYEOH1	
\$RUI	(CRAY LIBRARY)	1 MODULE:	EYEOH1	
\$RUV*	(CRAY LIBRARY)	1 MODULE:	EYEOH1	
\$WB	(CRAY LIBRARY)	2 MODULES:	EYEOH1 EYEOH2	
\$WFF	(CRAY LIBRARY)	5 MODULES:	EYEOH1 SUBRTO SUBRTO	SUBRTD SUBRTI
\$WFI	(CRAY LIBRARY)	5 MODULES:	EYEOH1 SUBRTO SUBRTO	SUBRTD SUBRTI

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* * SUMMARY BY ENTRY POINTS AND EXTERNALS * *
ENT. PT. & EXTERNALS REFERENCING MODULE(S)

3WFV%	(CRAY LIBRARY)	1	MODULE:	EYEOH1					
COS%	(CRAY LIBRARY)	6	MODULES:	SUBRTA SUBRTE	SUBRTB SUBRTF	SUBRTC	SUBRTD		
ENTRY1	(SUBRT)	2	MODULES:	SUBRTA	SUBRTZ				
ENTRY10	(SUBRT)	1	MODULE:	SUBRTA					
ENTRY2	(SUBRT)	1	MODULE:	SUBRTA					
ENTRY3	(SUBRT)	1	MODULE:	SUBRTA					
ENTRY4	(SUBRT)	1	MODULE:	SUBRTA					
ENTRY5	(SUBRT)	1	MODULE:	SUBRTA					

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* * SUMMARY BY ENTRY POINTS AND EXTERNALS * *
ENT. PT. & EXTERNALS REFERENCE MODULE(S)

ENTPY6 (SUBRT)	1	MODULE:	SUBRTA
ENTRY7 (SUBRT)	1	MODULE:	SUBRTA
ENTRY8 (SUBRT)	1	MODULE:	SUBRTA
ENTRY9 (SUBRT)	1	MODULE:	SUBRTA
ENTRYB (SUBRTB)	1	MODULE:	SUBRTA
ENTRYC (SUBRTC)	1	MODULE:	SUBRTB
ENTRYD (SUBRTD)	1	MODULE:	SUBRTB
ENTRYE (SUBRTE)	1	MODULE:	SUERTE

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* * SUMMARY BY ENTRY POINTS AND EXTERNALS. * *
ENT. PT. & EXTERNALS REFERENCING MODULE(S)

ENTRYF (SUBRTF)	1	MODULE:	SUBRTB
ENTRYG (SUBRTG)	1	MODULE:	SUBRTB
ENTRYH (SUBRTH)	1	MODULE:	SUBRTB
ENTRYI (SUBRTI)	1	MODULE:	SUBRTB
ENTRYJ (SUBRTJ)	1	MODULE:	SUBRTB
ENTRYK (SUBRTK)	1	MODULE:	SUBRTB
ENTRYL (SUBRTL)	1	MODULE:	SUBRTB
ENTRYM (SUBRTM)	1	MODULE:	SUBRTB

* * SUMMARY BY ENTRY POINTS AND EXTERNALS * *
ENT. PT. & EXTERNALS REFERENCING MODULE(S)

ENTRYN (SUBRTN)	1	MODULE:	SUBPTB
ENTRYO (SUBRTO)	1	MODULE:	SUBRTB
ENTRYP (SUBRTP)	1	MODULE:	SUBRTB
ENTRYQ (SUBRTQ)	1	MODULE:	SUBRTE
ENTRYR (SUBRTR)	1	MODULE:	SUBRTB
ENTRYS (SUBRTS)	1	MODULE:	SUBRTB
ENTRYT (SUBRTT)	1	MODULE:	SUBRTB
ENTRYU (SUBRTU)	1	MODULE:	SUBRTB

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* * SUMMARY BY ENTRY POINTS AND EXTERNALS * *
ENT. PT. & EXTERNALS REFERENCING MODULE(S)

ENTRYV (SUBRTV)	1	MODULE:	SUBRTB
ENTRYW (SUBRTW)	1	MODULE:	SUBRTB
ENTRYX (SUBRTX)	1	MODULE:	SUBRTB
ENTRYY (SUBRTY)	1	MODULE:	SUBRTB
ENTRYZ (SUBRTZ)	1	MODULE:	SUBRTB
EXP% (CRAY LIBRARY)	1	MODULE:	FUNCTNC
EYEOH1	1	MODULE:	SUBRTA
EYEOH2	1	MODULE:	SUBRTA
PAGE 29			

* * SUMMARY BY ENTRY POINTS AND EXTERNALS * *
ENT. PT. & EXTERNALS REFERENCING MODULE(S)

FUNCTNA	4 MODULES: FUNCTNC	SUBRT	SUBRTA	SUBRTD
FUNCTNB	3 MODULES: SUBRT	SUBRTA	SUBRTD	
FUNCTNC	1 MODULE: SUBRT			
SIN%	(CRAY LIBRARY)	7 MODULES: FUNCTNC	SUBRTA	SUBRTC
SQRT%	(CRAY LIBRARY)	SUBRTD	SUBRTB	SUBRTF
SUBRT0	2 MODULES: FUNCTNB	FUNCTNC		
SUBRT1	4 MODULES: SUBRTA	SUBRTB	SUBRTD	SUBRTZ
SUBRT2	3 MODULES: SUBRTO	SUBRTA	SUBRTB	
PAGE 30	2 MODULES: SUBRT1	SUBRTA		

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* * SUMMARY BY ENTRY POINTS AND EXTERNALS * *
ENT. PT. & EXTERNALS REFERENCING MODULE(S)

SUBRT3	2 MODULES:	SUBRT2	SUBRTB		
SUBRT4	4 MODULES:	SUBRT3	SUBRTA	SUBRTB	SUBRTD
SUBRT5	2 MODULES:	SUBRT4	SUBRTA		
SUBRT6	1 MODULE:	SUBRTA			
SUBRTC	3 MODULES:	SUBRTA	SUBRTB		
SUBRTD	2 MODULES:	SUBRTB	SUBRTC		
SUBRTE	1 MODULE:	SUBRTD			
SUBRTF	1 MODULE:	SUBRTE			

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* SUMMARY BY ENTRY POINTS AND EXTERNALS *
ENT. PT. & EXTERNALS REFERENCING MODULE(S)

SUBRTG	1	MODULE:	SUBRTF
SUBRTH	1	MODULE:	SUBRTG
SUBRTI	1	MODULE:	SUBRTH
SUBRTJ	1	MODULE:	SUBRTI
SUBRTK	1	MODULE:	SUBRTJ
SUBRTL	1	MODULE:	SUBRTK
SUBRTM	1	MODULE:	SUBRTL
SUBRTN	1	MODULE:	SUBRTM

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* * SUMMARY BY ENTRY POINTS AND EXTERNALS * *
ENT. PT. & EXTERNALS REFERENCING MODULE(S)

SUBRTO	1	MODULE:	SUBRTN
SUBRTP	1	MODULE:	SUBRTO
SUBRTQ	1	MODULE:	SUBRTP
SUBRTR	1	MODULE:	SUBRTQ
SUBRTS	1	MODULE:	SUBRTR
SUBRTT	1	MODULE:	SUBRTS
SUBRTU	1	MODULE:	SUBRTT
SUBRTV	1	MODULE:	SUBRTU

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* * SUMMARY BY ENTRY POINTS AND EXTERNALS * *
ENT. PT. & EXTERNALS REFERENCING MODULE(S)

SURRTW	1 MODULE:	SUBRTV			
SUBRTX	1 MODULE:	SUBRTW			
SUBRTY	1 MODULE:	SUBRTX			
SUBRTZ	5 MODULES:	SUBRTB SUBRTY	SUBRTV	SUBRTW	SUBRTX
TAN%	(CRAY LIBRARY)	1 MODULE:	SUBRTA		
UNSAT	(UNSATISFIED)	2 MODULES:	SUBRTA		SUBRTC
UNSATB	(UNSATISFIED)	1 MODULE:	SUBRTA		
UNSATC	(UNSATISFIED)	1 MODULE:	SUBRTA		

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* SUMMARY BY ENTRY POINTS AND EXTERNALS *
ENT. PT. & EXTERNALS REFERENCING MODULE(S)

UNSATD (UNSATISFIED)	1 MODULE:	SUBRTA
UNSAT E (UNSATISFIED)	1 MODULE:	SUBRTA
UNSATF (UNSATISFIED)	1 MODULE:	SUBRTA
UNSATG (UNSATISFIED)	1 MODULE:	SUBRTA
UNSAT H (UNSATISFIED)	1 MODULE:	SUBRTA
UNSAT I (UNSATISFIED)	1 MODULE:	SUBRTA
UNSAT J (UNSATISFIED)	1 MODULE:	SUBRTA
UNSATK (UNSATISFIED)	1 MODULE:	SUBRTA

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* * SUMMARY BY ENTRY POINTS AND EXTERNALS * *
ENT. PT. & EXTERNALS REFERENCING MODULE(S)

UNSATL (UNSATISFIED)	1 MODULE:	SUBRTA							
UNSATM (UNSATISFIED)	1 MODULE:	SUBRTA							
UNSATN (UNSATISFIED)	1 MODULE:	SUBRTA							
UNSATO (UNSATISFIED)	11 MODULES:	SUBRTA	SUBRTB	SUERTC	SUBRTD	SUBRTE	SUBRTF	SUBRTG	SUBRTH
		SUBRTI	SUERTJ	SUBRTK					

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* * COMMONS APPEARING IN THIS LIBRARY * *

//	ACOMMON	COMMON	COMMON1	COMMON2	COMMON3	COMMON4	COMMONA
COMMONB	COMMONC	COMMOND	COMMONE	COMMONF	COMMONG	COMMONH	COMMONI
COMMONJ	COMMONK	COMMONL	COMMONM	COMMONN	COMMONO	COMMONP	COMMONQ
COMMONR	COMMONS	COMMONT	COMMONU	COMMONV	COMMONW	COMMONX	COMMONY
COMMONZ	WRITCOMA						

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COM. NAME

* * * * * SUMMARY BY COMMONS * * * * *
MODULE(S) USING THE COMMON

//	10 MODULES:	SUBRTA	SUBRTE	SUBRTC	SUBRTD
		SUBRTE	SUBRTF	SUBRTG	SUBRTH
		SUBRTI	SUBRTJ		

ACOMMON	33 MODULES:	SUBRT	SUBRTO	SUBRT1	SUBRT2
		SUBRT3	SUBRT4	SUBRT5	SUBRTA
		SUBRTB	SUBRTC	SUBRTD	SUBRTE

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COM. NAME SUMMARY BY COMMONS
MODULE(S) USING THE COMMON

ACOMMON CONTINUED FROM PAGE 37

SUERTF	SUBRTG	SUBRTH	SUBRTI
SUBRTJ	SUBRTX	SUBRTL	SUBRTM
SUBRTN	SUBRTO	SUBRTP	SUBRTQ
SUBRTR	SUBRTS	SUBRTT	SUBRTU
SUBRTV	SUBRTW	SUERTX	SUBRTY
SUBRTZ			

COMMON 1 MODULE: SUBRTA

COMMON1 1 MODULE: SUBRT1

COMMON2 1 MODULE: SUBRT1

COMMON3 1 MODULE: SUBRT1

COMMON4 12 MODULES: SUBRT1 SUBRT4 SUBRT5 SUBRTG

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COM. NAME SUMMARY BY COMMONS
MODULE(S) USING THE COMMON

COMMON4 CONTINUED FROM PAGE 38

COMMONA	11 MODULES:	SUBRTH SUBRTL	SUBRTI SUBRTM	SUBRTJ SUBRTN	SUBRTK SUBRTO
COMMONB	5 MODULES:	SUBRTA SUBRTE	SUBRTB SUBRTF SUBRTJ	SUBRTC SUBRTG SUBRTK	SUBRTD SUBRTH
COMMONC	3 MODULES:	SUBRTA	SUBRTB	SUBRTC	SUBRTD
COMMOND	3 MODULES:	SUBRTA	SUBRTB	SUBRTC	SUBRTD
COMMONE	2 MODULES:	SUBRTA	SUBRTB	SUBRTC	SUBRTD

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. SUMMARY BY COMMONS
MODULE(S) USING THE COMMON

COM. NAME

COMMONF 1 MODULE: SUBRTA

COMMONG 1 MODULE: SUBRTA

COMMONH 1 MODULE: SUBRTA

COMMONI 1 MODULE: SUBRTA

COMMONJ 1 MODULE: SUBRTA

COMMONK 1 MODULE: SUBRTA

COMMONL 1 MODULE: SUBRTA

COMMONM 1 MODULE: SUBRTA

COMMONN 1 MODULE: SUBRTA

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COM. NAME SUMMARY BY COMMONS
MODULE(S) USING THE COMMON

COMMONW	1	MODULE: SUBRTA				
COMMONX	1	MODULE: SUBRTA				
COMMONY	1	MODULE: SUBRTA				
COMMONZ	1	MODULE: SUBRTA				
WRITCOMA	4	MODULES: EYEOH1	EYEOH2	SUBRTA	SUBRTD	

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* * * * * STATISTICS * * * * *

MODULES 43

ENTRY POINTS 81

COMMONS 34

UNSAT. EXTERNALS 15

RELOCATABLE DIRECTORY LENGTH 593

WORDS REQUIRED TO LOAD ALL
RELOCATABLE MODULES IN THE
SELECTED LIBRARY.

7972 DECIMAL

17444 OCTAL

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TABLE OF CONTENTS

PAGE	SUBJECT
1.....	MODULES IN SELECTED LIBRARY
1.....	SUMMARY BY MODULES
21.....	ENTRY POINTS IN THE SELECTED LIBRARY
22.....	ENTRY POINTS NOT REFERENCED BY THIS LIBRARY
22.....	UNSATISFIED EXTERNALS
22.....	SUMMARY BY ENTRY POINTS AND EXTERNAL
37.....	COMMONS USED BY SELECTED LIBRARY
37.....	SUMMARY BY COMMONS
43.....	STATISTICS

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APPENDIX C

Logfile of CROSSREF when set up to include systems routine and to format output to a CRT display.

1. Report No. NASA CR- 177384	2. Government Acquisition No.	3. Recipient's Catalog No.
4. Title and Subtitle Crossref for the Cray		5. Report Date November 1985
7. Author(s) Clayton J. Guest		6. Performing Organization Code
9. Performing Organization Name and Address Informatics General Corporation 1121 San Antonio Road Palo Alto, CA 94303		8. Performing Organization Report No. TN 84-7104-101-12
12. Sponsoring Agency Name and Address National Aeronautics and Space Administration Washington, D.C. 20546		10. Work Unit No. K1707
		11. Contract or Grant No. NAS2-11555
		13. Type of Report and Period Covered Contractor Report
		14. Sponsoring Agency Code 999-53-02
15. Supplementary Notes Point of Contact: Robert A. Carlson (415) 694-6036 MS: 233-15 Ames Research Center FTS 448-6036 Moffett Field, CA 94035		
16. Abstract Crossref for the Cray is a tool used to obtain information about the contents of a library generated with a BUILD statement under COS. It produces a list of all modules in the library; a summary table by modules containing module size, ENTRY POINTS, referenced COMMONs, and required EXTERNALs; a list of unsatisfied EXTERNALs; a summary table of ENTRY POINTS and optionally EXTERNALs; a list of COMMONs; a table of statistics and a table of contents. The output can be formatted to 8 1/2 inch vertical paper or CRT display.		
17. Key Words (Suggested by Author(s)) Alphabetized library listing, Cray cross reference, software tool		18. Distribution Statement Unclassified, unlimited Star Category - 61
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 73
		22. Price*